



Desert Sky Observer

Volume 36

Antelope Valley Astronomy Club Newsletter

August 2016

Up-Coming Events

August 6: [Star-B-Que](#)

August 12: Club Meeting*

August 27: [Prime Desert Moonwalk](#)

* Monthly meetings are held at the S.A.G.E. Planetarium in Palmdale, the second Friday of each month. The meeting location is at the northeast corner of Avenue R and 20th Street East. Meetings start at 7 p.m. and are open to the public. *Please note that food and drink are not allowed in the planetarium*



President

Frank Moore

Well folks it's been a rather eventful month with the headlines dominated by hot weather and several wildland fires that have affected our activities.

First, the July 2 Dark Sky Star Party, which was originally scheduled to be held at the Chuchupate observing site near Lockwood Valley, had to be moved to the Mount Pinos observing site, literally at the top of the mountain and the end of the road, as the Chuchupate parking lot had been taken over by helicopters and fire crews working the Pine Fire. I apologize to those who had to make sudden changes to their plans. I tried to anticipate this possibility, and when I called the Mount Pinos Ranger District several days before the event had been assured that they had no plans to take over the lot. Oh well, I guess the fire had other plans. I also apologize for failing to mention that there are no longer pit toilets in the Mt. Pinos parking lot when I mentioned the venue change. Since we have a motor home, it's a little detail that escaped me.

On a bright note, and somewhat of a surprise considering the proximity of the Pine Fire, is that those who went on up to Mt. Pinos reported that the skies were dark, clear, and steady. I was astounded to hear that they were even able to see the Veil Nebula without the use of narrowband filters like an Oxygen III. Unfortunately, Rose and I were once again unable to make the event because my mother's health problems demanded that we stay close to home.

We had a wonderful, and well attended, meeting on Friday July 8 with Dr. Luisa Rebull speaking on the vast wealth of data available to amateur astronomers and researchers via the various Citizen Science and Zooniverse sites. I haven't waded into it yet but I certainly intend to.

On Saturday July 23, I was loading the telescope gear into our car for the Prime Desert Woodland Moonwalk, under clear blue skies in Tehachapi, when Jeremy Amarant sent me a message that the event was canceled due to smoke and ash from the Sand Fire. I had no idea it had gotten so big or that the sky was totally occluded in Lancaster. Tom Koonce later sent me an image of the sky over Quartz Hill and I fully understood how bad it was. The next day I intended to do some solar observing from our driveway but, by then, the smoke had moved into our neighborhood as well. Between the Sand Fire and the Soberanes Fire between Carmel and Big Sur, the sky here has been smoky ever since.

On Saturday August 6 we have our annual Star-B-Cue, followed by a public star party, at the Brite Lake Recreational Area near Tehachapi. I hope there's less smoke from the fires by then though, even on the worst days, the sky seems to clear here at night. The picnic is scheduled for 4:00 pm and I hope everyone will make an effort to be there around that time so we can cook, eat, have a few raffles and the silent auction, and have plenty of time to get our telescopes setup before dark. Once again the Tehachapi Valley Recreation and Parks District will be turning off the lights in the parking lot and the Tehachapi Cummings County Water District will be turning the lights off at their nearby facility so we may enjoy truly dark skies. The Tehachapi News has published a wonderful article promoting the star party.

If you have not RSVP'd, letting us know if you are coming to the picnic, please send an email or make telephone call so we know how many to expect and thus how much food, in the way of meat, dogs, buns, and beverages we need to buy. I know it's a ways to come, but it's the triple digit summer temperatures in the Antelope Valley that led us to move it to Tehachapi six years ago. Daytime highs are currently predicted to be in the high 80's on the picnic date with nighttime lows in the mid 60's. The dark skies are also a bonus and, in addition to solar system and deep sky objects, we may catch some late Delta Aquarid and early Perseid meteors. A separate email will be sent out with details and directions. In the meantime, a Google map can be found here: <https://goo.gl/VpVdVM>

Vice President

Bill Schebeck

The guest speaker at the July meeting was Dr Luisa Rebull, Research Scientist at Caltech. Her presentation was on how to access centrally located information we can use to do our own research. She posted the slides from her presentation and reference material on the following web site
<http://web.ipac.caltech.edu/staff/rebull/outr/datalinks.html>

If you have questions related to this area, she can be reached at rebull@ipac.caltech.edu or by phone at 626-395-4565

Next months meeting will have Dr. Warren Skidmore with the Thirty-meter Telescope Project. He is bringing several associates that live in our area so it should be an interesting meeting.

In September Timothy Thompson will be back to talk to us about the size of the Universe. Maybe he can give us some special insight into Mt Wilson as he is a docent, Session Director and on the Board of trustees.

See you at the next Prime Desert Woodlands outing and the next meeting.

Space Place

Venus and Jupiter prepare for their close-up this August

By Ethan Siegel

As Earth speeds along in its annual journey around the Sun, it consistently overtakes the slower-orbiting outer planets, while the inner worlds catch up to and pass Earth periodically. Sometime after an outer world—particularly a slow-moving gas giant—gets passed by Earth, it appears to migrate closer and closer to the Sun, eventually appearing to slip behind it from our perspective. If you've been watching Jupiter this year, it's been doing exactly that, moving consistently from east to west and closer to the Sun ever since May 9th.

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On the other hand, the inner worlds pass by Earth. They speed away from us, then slip behind the Sun from west to east, re-emerging in Earth's evening skies to the east of the Sun. Of all the planets visible from Earth, the two brightest are Venus and Jupiter, which experience a conjunction from our perspective only about once per year. Normally, Venus and Jupiter will appear separated by approximately 0.5° to 3° at closest approach. This is due to the fact that the Solar System's planets don't all orbit in the same perfect, two-dimensional plane.

But this summer, as Venus emerges from behind the Sun and begins catching up to Earth, Jupiter falls back toward the Sun, from Earth's perspective, at the same time. On August 27th, all three planets—Earth, Venus and Jupiter—will make nearly a perfectly straight line.

As a result, Venus and Jupiter, at 9:48 PM Universal time, will appear separated by only 4 arc-minutes, the closest conjunction of naked eye planets since the Venus/Saturn conjunction in 2006. Seen right next to one another, it's startling how much brighter Venus appears than Jupiter; at magnitude -3.80 , Venus appears some eight times brighter than Jupiter, which is at magnitude -1.53 .

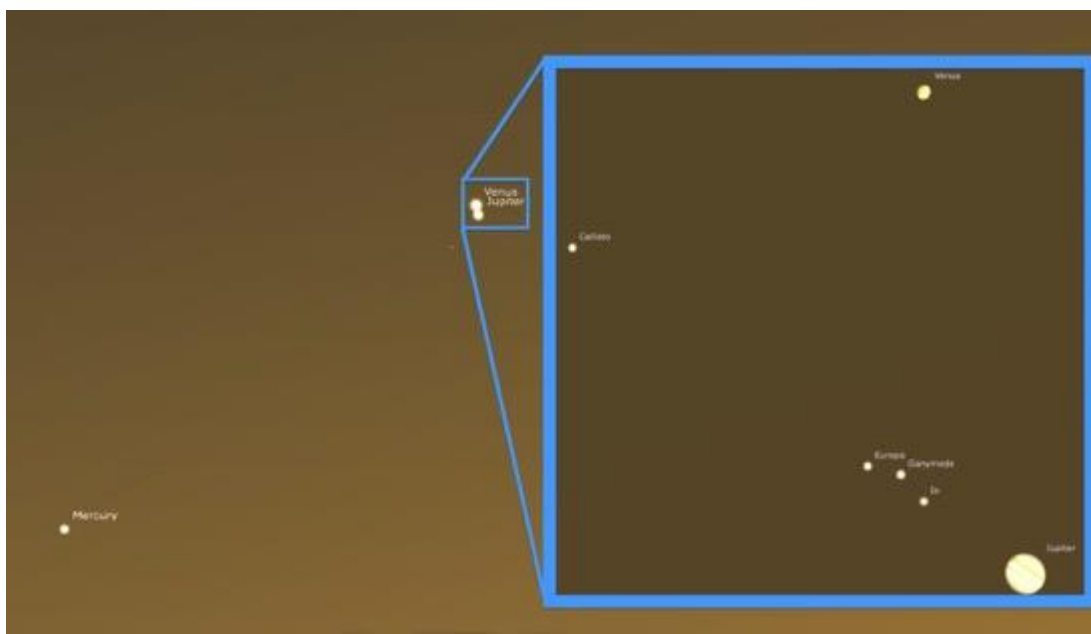


Image credit: E. Siegel, created with Stellarium, of a small section of the western skies as they will appear this August 27th just after sunset from the United States, with Venus and Jupiter separated by less than 6 arc-minutes as shown. Inset shows Venus and Jupiter as they'll appear through a very good amateur telescope, in the same field of view.

Look to the western skies immediately after sunset on August 27th, and the two brightest planets of all—brighter than all the stars—will make a dazzling duo in the twilight sky. As soon as the sun is below the horizon, the pair will be about two fists (at arm's length) to the left of the sun's disappearance and about one fist above a flat horizon. You may need binoculars to find them initially and to separate them. Through a telescope, a large, gibbous Venus will appear no more distant from Jupiter than Callisto, its farthest Galilean satellite.

As a bonus, Mercury is nearby as well. At just 5° below and left of the Venus/Jupiter pair, Mercury achieved a distant conjunction with Venus less than 24 hours prior. In 2065, Venus will actually occult Jupiter, passing in front of the planet's disk. Until then, the only comparably close conjunctions between these two worlds occur in 2039 and 2056, meaning this one is worth some special effort—including traveling to get clear skies and a good horizon—to see!

News Headlines

Re-entering Chinese rocket stage streaks across Western U.S.

A flaming fragment of space junk from China's newest satellite launcher blazed through Earth's atmosphere over the Western United States late Wednesday. Darting across the skies of California, Nevada, Utah, Idaho and Colorado, the object disintegrated into numerous chunks before disappearing. The relatively slow speed of the fireball — it took nearly a minute to cross the sky — ruled out a natural origin, experts said.

<https://spaceflightnow.com/2016/07/28/re-entering-chinese-rocket-stage-streaks-across-western-u-s/>

Go someplace dark and watch meteors!

In the coming nights, treat yourself to one of nature's spectacles. Every year, people look forward to the August Perseid meteor shower. And it's wonderful, with regular rates of about 60 meteors per hour and with a possibility of a Perseid outburst in 2016. The Perseid shower is expected to produce the greatest number of meteors on the night of August 11-12, 2016. It's on that night that you might see the Perseid outburst, with perhaps 200 meteors per hour at the peak. But you don't need to see that many to enjoy watching meteors. And the Perseids are known to rise to a peak gradually, so they'll be increasing in numbers every night over the coming weeks. Plus the Delta Aquarids will be raining down steadily, night after night.

<http://goo.gl/Y8AoWf>

SpaceX's 1st Test-Fire of a Used Falcon 9 Rocket

On July 28 SpaceX released video of its first test firing of a used Falcon 9 rocket stage, one that already launched and landed during a mission in May. The burn lasted for about 2 minutes and 30 seconds, and a brief description of the video said the test was "full duration." Hans Koenigsmann, vice president of flight reliability at SpaceX, said on July 16 that the company plans to launch one of its used rockets this fall, assuming it has a customer for the flight. The company also plans to reuse one of its Dragon cargo capsules for a cargo delivery mission to the International Space Station, representatives of SpaceX and NASA said earlier this month.

<http://www.space.com/33593-spacex-first-test-firing-used-falcon-9.html>

Chorus of Black Holes Sings in X-Rays

Supermassive black holes in the universe are like a raucous choir singing in the language of X-rays. When black holes pull in surrounding matter, they let out powerful X-ray bursts. This song of X-rays, coming from a chorus of millions of black holes, fills the entire sky -- a phenomenon astronomers call the cosmic X-ray background. NASA's Chandra mission has managed to pinpoint many of the so-called active black holes contributing to this X-ray background, but the ones that let out high-energy X-rays -- those with the highest-pitched "voices" -- have remained elusive.

<http://goo.gl/o6RKU4>

August Sky Data

New Aug 3 First Qtr Aug 10 Full Aug 18 Last Qtr Aug 22

**Best time for deep sky observing this month:
August 1 thru 5 and 24 thru 31**



Mercury reaches greatest elongation from the Sun on August 16th but, sadly, never gets that high above the horizon in the western sky.

Venus can be seen very low in the western sky after sunset so, despite its brilliant magnitude of -3.9, will still be hard to spot. Its angular diameter increases from 10.1 to 10.9 arc seconds during the month.

As August begins, **Mars** transits around sunset and so will be seen in the south-western sky during the evening. Its magnitude drops from -0.8 to -0.3 during the month as its angular size falls from 13 to 10.5 arc seconds. Sadly, its low elevation will hinder our view.

Jupiter can be seen low above the western horizon after sunset but throughout the month is sinking slowly into the Sun's glare. It remains at magnitude -1.7 throughout most of August while its angular diameter reduces slightly from 32.1 to 30.9 arc seconds.

Saturn has its rings as nearly open as they can be and so still makes a great sight through a small telescope. It dims slightly from magnitude +0.4 to +0.5 during August as its angular size falls slightly from 17.5 to 16.7 arc seconds.

Astronomers expect an outburst of Perseid **meteors** this year! It's the first such outburst since 2009. The prediction is for 200 meteors per hour seen on the peak night, August 11-12 (evening of August 11, morning of August 12). That's about double the usual rate. A waxing gibbous moon sets before the predawn hours. So if the outburst occurs before dawn for you, the moon won't be in the way. The peak rates are predicted to last about half a day, from late August 11 to mid-August 12 UTC. But, outburst or no outburst, the Perseids are always a treat.

Sun and Moon Rise and Set

Date	Moonrise	Moonset	Sunrise	Sunset
8/1/2016	05:53	20:01	07:02	20:53
8/5/2016	09:51	22:38	07:05	20:49
8/10/2016	14:24	-----	07:08	20:44
8/15/2016	18:43	04:29	07:12	20:39
8/20/2016	22:15	09:41	07:16	20:33
8/25/2016	01:04	15:09	07:19	20:26
8/31/2016	06:43	20:02	07:24	20:18

Planet Data

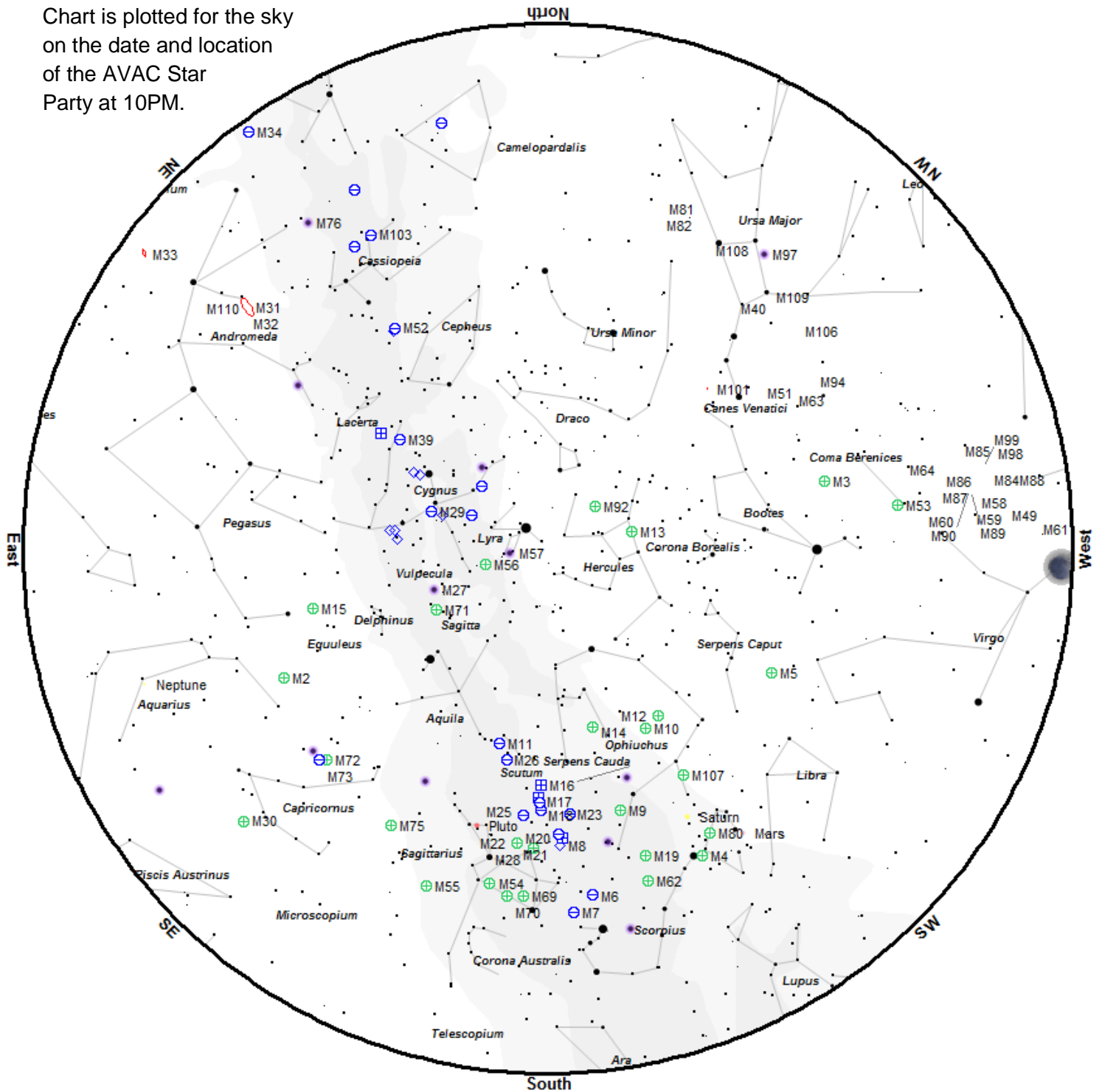
	Aug 1			
	Rise	Transit	Set	Mag
Mercury	07:53	14:29	21:07	-0.1
Venus	07:12	14:00	20:50	-3.9
Mars	14:54	19:54	00:55	-0.8
Jupiter	09:19	15:41	21:59	-1.8
Saturn	15:32	20:41	01:49	0.4

	Aug 15			
	Rise	Transit	Set	Mag
Mercury	08:23	14:36	20:49	0.3
Venus	07:41	14:10	20:41	-3.9
Mars	14:28	19:25	00:21	-0.5
Jupiter	08:37	14:55	21:11	-1.7
Saturn	14:37	19:45	00:54	0.4

	Aug 31			
	Rise	Transit	Set	Mag
Mercury	07:57	13:59	19:56	1.4
Venus	08:12	14:19	20:27	-3.9
Mars	14:05	18:58	23:51	-0.3
Jupiter	07:50	14:05	20:16	-1.7
Saturn	13:35	18:43	23:52	0.5

Planet, Sun, and Moon data calculated for local time at Lancaster, CA

Chart is plotted for the sky on the date and location of the AVAC Star Party at 10PM.



Star Magnitudes	Galaxy	Nebula
● ● ● ● ● ●	Open Cluster	Bright Nebula
0 1 2 3 4 5	Globular Cluster	Planetary Nebula
	Cluster+Nebulosity	

To use the chart, go outside within an hour or so of the time listed and hold it up to the sky. Turn the chart so the direction you are looking is at the bottom of the chart. If you are looking to the south then have 'South horizon' at the lower edge.

Suggested Observing List

The list below contains objects that will be visible on the night of the AVAC Star Party. The list is sorted by the best time to observe the object. The difficulty column describes how difficult it is to observe the object from the current location on a perfect night in a 6 inch Newtonian telescope.

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
NGC 6193	Open	Ara	16h41m20.0s	-48°45'48"	5.4	21:00	21:10	21:26	difficult
NGC 6178	Open	Sco	16h35m47.0s	-45°38'36"	7.2	20:59	21:13	21:42	detectable
NGC 5986	Glob	Lup	15h46m03.0s	-37°47'12"	7.6	21:04	21:15	21:30	difficult
NGC 6124	Open	Sco	16h25m20.0s	-40°39'12"	6.3	20:57	21:16	22:12	challenging
NGC 5897	Glob	Lib	15h17m24.0s	-21°00'36"	8.4	21:10	21:20	21:42	challenging
NGC 6322	Open	Sco	17h18m25.0s	-42°56'00"	6.5	20:58	21:24	22:43	easy
M 80	Glob	Sco	16h17m02.0s	-22°58'30"	7.3	21:03	21:24	22:42	detectable
M 106	Gal	CVn	12h18m57.6s	+47°18'13"	9.1	21:10	21:26	21:34	detectable
M 94	Gal	CVn	12h50m53.1s	+41°07'12"	8.7	21:06	21:26	21:53	detectable
M 3	Glob	CVn	13h42m11.0s	+28°22'42"	6.3	21:06	21:26	22:15	easy
M 5	Glob	Ser	15h18m34.0s	+02°05'00"	5.7	21:03	21:26	22:44	easy
M 62	Glob	Oph	17h01m13.0s	-30°06'48"	6.4	21:03	21:27	23:00	detectable
NGC 5195	Gal	CVn	13h29m59.6s	+47°15'58"	10.5	21:10	21:28	22:40	detectable
M 51	Gal	CVn	13h29m52.3s	+47°11'40"	8.7	21:06	21:28	22:44	easy
M 19	Glob	Oph	17h02m38.0s	-26°16'06"	6.8	21:05	21:29	23:01	detectable
NGC 6388	Glob	Sco	17h36m17.0s	-44°44'06"	6.8	21:07	21:29	22:20	challenging
M 101	Gal	UMa	14h03m12.4s	+54°20'53"	8.4	21:10	21:30	23:07	detectable
M 12	Glob	Oph	16h47m14.0s	-01°56'48"	6.1	21:02	21:31	23:58	easy
M 10	Glob	Oph	16h57m09.0s	-04°06'00"	6.6	21:04	21:32	23:49	detectable
M 9	Glob	Oph	17h19m12.0s	-18°31'00"	7.8	21:07	21:32	23:05	difficult
NGC 6383	Open	Sco	17h34m48.0s	-32°34'00"	5.4	21:02	21:33	23:35	easy
M 13	Glob	Her	16h41m41.0s	+36°27'36"	5.8	21:03	22:15	01:10	easy
NGC 6633	Open	Oph	18h27m15.0s	+06°30'30"	5.6	21:01	22:15	02:07	easy
IC 4665	Open	Oph	17h46m18.0s	+05°43'00"	5.3	21:07	22:15	00:31	detectable
M 14	Glob	Oph	17h37m36.0s	-03°14'48"	7.6	21:05	22:15	00:20	detectable
M 16	Open	Ser	18h18m48.0s	-13°48'24"	6.5	20:57	22:15	00:37	obvious
M 17	Open	Sgr	18h20m47.0s	-16°10'18"	7.3	21:10	22:15	00:14	difficult
M 92	Glob	Her	17h17m07.0s	+43°08'12"	6.5	21:03	22:15	01:48	easy
M 23	Open	Sgr	17h57m04.0s	-18°59'06"	5.9	21:05	22:15	23:38	detectable
M 21	Open	Sgr	18h04m13.0s	-22°29'24"	7.2	21:05	22:15	23:10	detectable
M 20	Open	Sgr	18h02m42.0s	-22°58'18"	5.2	21:03	22:15	23:03	easy
M 28	Glob	Sgr	18h24m33.0s	-24°52'12"	6.9	21:36	22:15	22:48	detectable
M 6	Open	Sco	17h40m20.0s	-32°15'12"	4.6	20:59	22:15	23:53	easy
NGC 6541	Glob	CrA	18h08m02.0s	-43°42'54"	6.3	21:16	22:15	22:51	challenging
NGC 6543	PNe	Dra	17h58m33.4s	+66°37'59"	8.3	20:54	22:16	04:01	obvious
M 7	Open	Sco	17h53m51.0s	-34°47'36"	3.3	21:01	22:15	23:43	detectable
NGC 6572	PNe	Oph	18h12m06.4s	+06°51'12"	8.0	20:50	22:16	01:52	obvious
M 8	Neb	Sgr	18h04m02.0s	-24°23'14"	5.0	21:03	22:15	22:39	easy

ID	Cls	Con	RA 2000	Dec 2000	Mag	Begin	Best	End	Difficulty
M 18	Open	Sgr	18h19m58.0s	-17°06'06"	7.5	21:00	22:16	00:17	easy
M 25	Open	Sgr	18h31m47.0s	-19°07'00"	6.2	21:07	22:19	00:13	detectable
M 22	Glob	Sgr	18h36m24.0s	-23°54'12"	5.2	21:27	22:24	23:21	detectable
IC 4756	Open	Ser	18h39m00.0s	+05°27'00"	5.4	21:05	22:27	01:50	easy
M 70	Glob	Sgr	18h43m13.0s	-32°17'30"	7.8	21:13	22:30	00:13	detectable
M 11	Open	Sct	18h51m05.0s	-06°16'12"	6.1	21:06	22:39	01:34	detectable
M 57	PNe	Lyr	18h53m35.1s	+33°01'45"	9.4	21:01	22:41	03:25	easy
NGC 6716	Open	Sgr	18h54m34.0s	-19°54'06"	7.5	21:06	22:42	00:28	detectable
M 54	Glob	Sgr	18h55m03.0s	-30°28'42"	7.7	21:25	22:43	00:16	difficult
NGC 6723	Glob	Sgr	18h59m33.0s	-36°37'54"	6.8	21:27	22:47	00:16	detectable
M 56	Glob	Lyr	19h16m36.0s	+30°11'06"	8.4	21:10	23:04	02:31	detectable
M 55	Glob	Sgr	19h40m00.0s	-30°57'42"	6.3	21:45	23:27	01:19	detectable
NGC 6818	PNe	Sgr	19h43m57.8s	-14°09'12"	10.0	21:04	23:31	01:59	easy
M 71	Glob	Sge	19h53m46.0s	+18°46'42"	8.4	21:04	23:41	03:40	easy
M 27	PNe	Vul	19h59m36.3s	+22°43'16"	7.3	21:07	23:47	03:50	easy
NGC 6871	Open	Cyg	20h05m59.0s	+35°46'36"	5.8	21:07	23:53	04:18	easy
NGC 6910	Open	Cyg	20h23m12.0s	+40°46'42"	7.3	21:05	00:10	04:37	easy
M 29	Open	Cyg	20h23m57.0s	+38°30'30"	7.5	21:06	00:11	04:33	easy
NGC 7009	PNe	Aqr	21h04m10.9s	-11°21'48"	8.3	22:07	00:51	03:35	obvious
M 15	Glob	Peg	21h29m58.0s	+12°10'00"	6.3	21:48	01:17	04:39	easy
M 39	Open	Cyg	21h31m48.0s	+48°26'00"	5.3	21:10	01:19	04:48	easy
M 2	Glob	Aqr	21h33m27.0s	-00°49'24"	6.6	22:16	01:20	04:29	detectable
IC 1396	Neb	Cep	21h39m06.0s	+57°30'00"		21:13	01:26	04:47	challenging
M 30	Glob	Cap	21h40m22.0s	-23°10'42"	6.9	00:18	01:28	02:38	detectable
NGC 7160	Open	Cep	21h53m40.0s	+62°36'12"	6.4	21:03	01:40	04:54	obvious
IC 5146	Neb	Cyg	21h53m24.0s	+47°16'00"	10.0	21:15	01:41	04:49	challenging
NGC 7243	Open	Lac	22h15m08.0s	+49°53'54"	6.7	22:05	02:02	04:46	detectable
M 52	Open	Cas	23h24m48.0s	+61°35'36"	8.2	23:09	03:11	04:44	detectable
NGC 7789	Open	Cas	23h57m24.0s	+56°42'30"	7.5	23:52	03:43	04:44	detectable
NGC 7790	Open	Cas	23h58m24.0s	+61°12'30"	7.2	21:45	03:44	04:55	easy
M 110	Gal	And	00h40m22.3s	+41°41'09"	8.9	00:41	04:10	04:48	detectable
M 31	Gal	And	00h42m44.3s	+41°16'07"	4.3	00:00	04:10	04:51	easy
M 32	Gal	And	00h42m41.8s	+40°51'58"	8.9	23:57	04:11	04:51	easy
NGC 457	Open	Cas	01h19m35.0s	+58°17'12"	5.1	23:14	04:15	04:53	obvious
NGC 559	Open	Cas	01h29m31.0s	+63°18'24"	7.4	23:10	04:15	04:52	easy
M 103	Open	Cas	01h33m23.0s	+60°39'00"	6.9	23:22	04:16	04:54	obvious
NGC 637	Open	Cas	01h43m04.0s	+64°02'24"	7.3	23:21	04:17	04:55	obvious
NGC 663	Open	Cas	01h46m09.0s	+61°14'06"	6.4	23:40	04:17	04:51	easy

A.V.A.C. Information

Membership in the Antelope Valley Astronomy Club is open to any individual or family.

The Club has three categories of membership.

- Family membership at \$30.00 per year.
- Individual membership at \$25.00 per year.
- Junior membership at \$15.00 per year.

Membership entitles you to...

- Desert Sky Observer—monthly newsletter.
- The Reflector – the publication of the Astronomical League.
- The A.V.A.C. Membership Manual.
- To borrow club equipment, books, videos and other items.

AVAC
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Visit the Antelope Valley Astronomy Club website at www.avastronomyclub.org/

The Antelope Valley Astronomy Club, Inc. is a 501(c)(3) Non-Profit Corporation.

The A.V.A.C. is a Sustaining Member of The Astronomical League and the International Dark-Sky Association.

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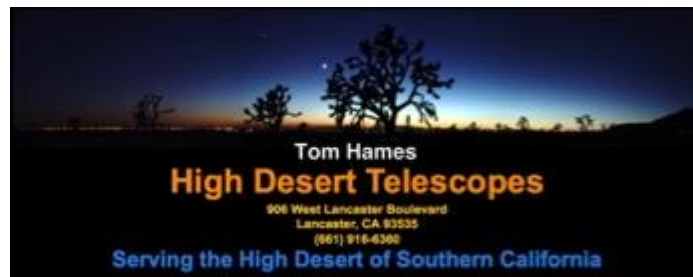


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